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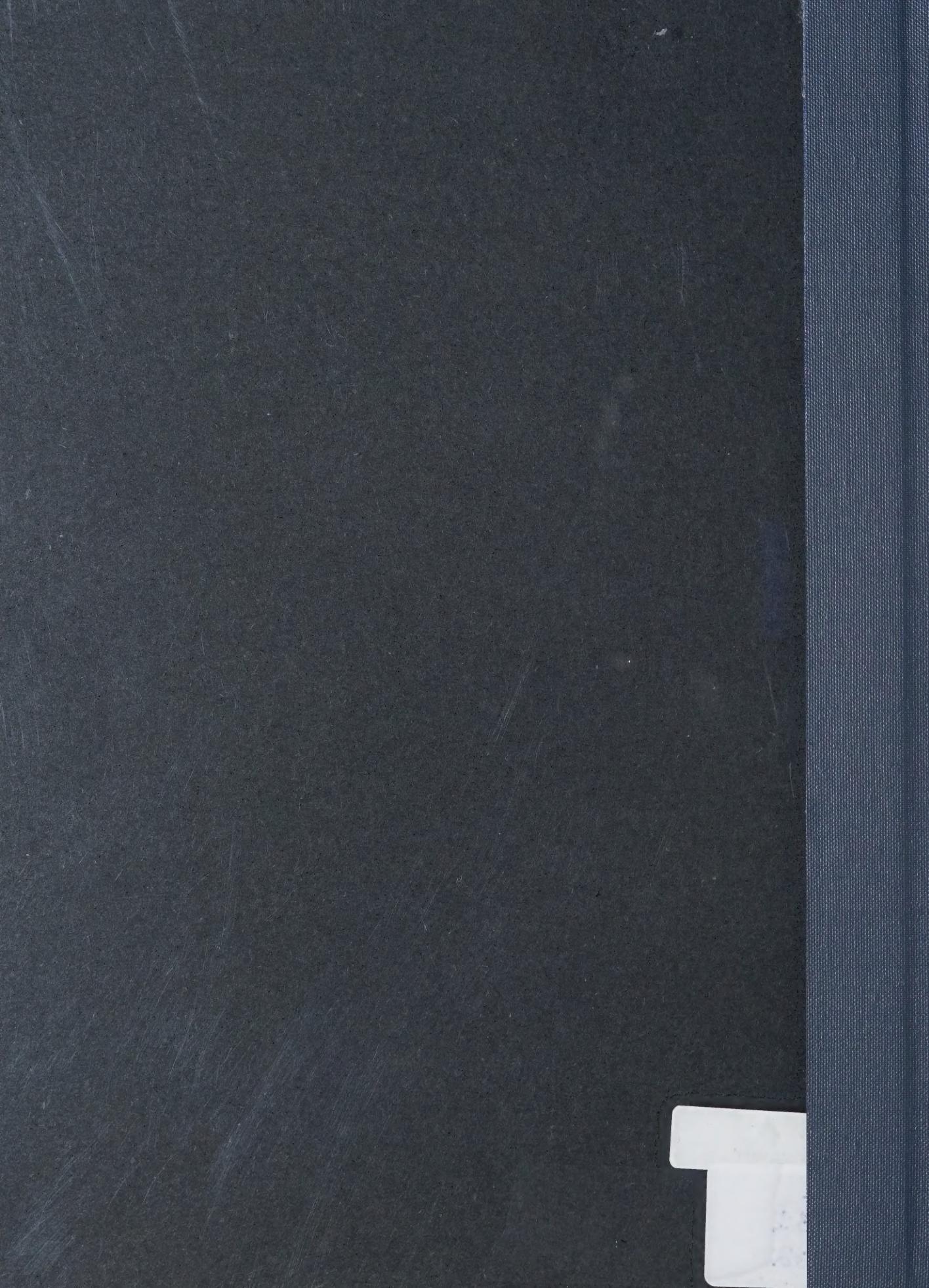
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# Agriculture in Third World Countries

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## AGRICULTURE IN THIRD WORLD COUNTRIES

In most countries of the Third World, the population is largely rural. Subsistence farming is still often the main occupation, with women responsible for at least half of the food grown. The greatest challenge in agricultural development and food production is to get millions of these small farmers to adopt new techniques that improve their productivity and income.

Both political and physical constraints hinder agricultural production in many developing countries. The world food problem is widely recognized as being more political and economic than technical and agronomic; this is largely the result of policies that have either neglected agricultural development altogether or encouraged only the production of export crops, preventing the small subsistence farmers from producing the necessary surpluses to improve their income and feed the growing cities.

Most farmers in developing countries do not have access to government sponsored services such as credit. Consequently, they are unable to purchase essential inputs such as improved seeds, fertilizer and pesticides - when these are available. They are also unable to invest money in the purchase of the land, oxen, small motorized equipment and farming appliances that they need. Those who rent land are often exploited by the landowners, who charge excessive rates. Unable to pay their debts, farmers are often dispossessed of their land. Others inherit barren, spent tracts in the mountains. Through their overuse of this fragile soil, they increase the risk of erosion, one of the most destructive forces affecting agriculture. The absence of adequate transportation and marketing services is also a common impediment to increased food production by small farmers.

In addition to erosion, desertification and salinization pose serious threats to agriculture. In the case of desertification, over-grazing, inappropriate farming practices and deforestation hasten the desert's advance. With salinization, the root of the problem is the insufficient drainage of irrigated land, as water from underground sources rises to the surface and evaporates, leaving a residue of minerals and salts that stifles plant growth.

Farmers have to contend not only with ecological hindrances, but also with vagaries of the weather - floods, drought and so on. In addition, they must protect their herds from epidemics and their land from the animals, birds and insects that can cause serious damage.

In the last 10 years, real progress has been made toward food and agricultural self-reliance in a number of countries such as South Korea, Taiwan, India, Thailand and the Philippines. But many other countries remain beset with serious and precarious problems, and millions in Asia, Latin America and the Near East are still impoverished and malnourished. Drought-stricken Northeast Brazil is a good example. A worsening food crisis, with chronic famine conditions, is also developing in sub-Saharan Africa, where food production has failed to keep pace with the rapid growth in population. In the 32 countries of sub-Saharan Africa recently surveyed

by the Food and Agriculture Organization (FAO), food production per capita has decreased in 23, and increased in only 9 in the last decade.

An encouraging aspect of agricultural development is that it is possible to make major turn-arounds. In 1967, for example, a distinguished world authority indicated that there were grave doubts about the Indian sub-continent ever being self-sufficient with respect to food. Today, less than 20 years later, India exports cereals, primarily due to the impact of the high-yielding varieties of wheat and rice developed by the International Agricultural Research Centres.

#### Canada's Role

Many agricultural problems, of course, cannot be solved overnight. To a large extent, prospects for improvement lie with the governments of Third World countries undertaking to revise their policies so as to accord higher priority to agricultural production. Progress also depends, however, on the willingness of the governments of the developed countries to increase their technical and financial assistance to Third World nations. This, in essence, is what Canada is attempting to do by sharing its agricultural skills where these are relevant to developing countries' needs. To this end, the Canadian government has given the Canadian International Development Agency (CIDA) responsibility for identifying and administering worthwhile agricultural projects making use of Canadian resources.

There are various ways in which CIDA lends support to agricultural development: it provides bilateral (government-to-government) assistance to help Third World countries identify their agricultural priorities and to match their needs with the areas of Canadian capability and expertise; CIDA recruits Canadians having the necessary special skills to implement agriculture projects; and it makes use of services and skills available in universities, provincial governments, professional associations and other sectors of the private sector.

CIDA also promotes agricultural development by supporting the activities of international organizations, such as agencies of the United Nations (United Nations Development Program, International Fund for Agricultural Development, Food and Agriculture Organization), financial institutions (regional development banks), and research centres supported by the Consultative Group on International Agricultural Research.

In addition, Canadian non-governmental organizations (NGOs), such as CUSO and CARE Canada, and international organizations, such as the Commonwealth Association of Scientific Agricultural Societies, receive grants from CIDA to undertake agricultural development projects in Third World countries. CIDA's NGO program is designed to help Canadians establish relationships as equals and partners with people of developing countries, offering them the range of skills and services available within the NGOs. NGO activity in this sector is concentrated largely on grass-roots efforts in the areas of farmers' organizations, training, food production and marketing activities.

CIDA's federal/provincial program, Voluntary Agricultural Development Assistance, is very active in the field of agriculture and its chief contributors, besides the federal and provincial governments, are private groups, individuals and non-governmental organizations.

CIDA's major fields of activity in the agriculture sector are training, research and the transfer of various techniques in dryland farming, livestock management, the control of plant and animal diseases as well as harmful insects, seed multiplication, certification and distribution, grain storage and the control of crop losses in central storage depots, land and water development -- including irrigation and drainage -- and the processing and preservation of agricultural products. The creation of farm credit institutions, the organization and management of cooperatives and marketing services and the provision of assistance in agricultural planning are also areas in which CIDA provides assistance to developing countries.

The following are only a few among approximately 400 bilateral projects - with a total Canadian contribution of \$1.4 billion - which CIDA is implementing, or has implemented since 1968, in the agriculture sector.

#### Training

In Morocco, CIDA contributed \$5 million for a technical assistance project at the Hassan II National Institute of Agronomy and Veterinary Sciences. For 10 years (1973-82), a team of Canadian teachers was provided to train surveying engineers in the geodetic sciences (surveying, photogrammetry and cartography). Concurrently, technicians were trained over a five-year period (1974-78) at the School of Rural Engineering and Surveying, which is an affiliate of the Hassan II Institute. Canada also provided the teaching materials necessary for presenting these highly technical subjects and ensured the training in Canada of the Moroccan team responsible for taking over after the Canadians' departure. Similar projects involving Laval University and the University of Manitoba are in progress in Haiti, Zambia and Rwanda.

#### Research

In its efforts to promote agricultural research, CIDA provides assistance to the Consultative Group on International Agricultural Research (CGIAR), an informal network of government, international and regional organizations and private foundations, which supports 13 strategic international agricultural research centres and programs. The centres concentrate on those farming and livestock systems that yield three-quarters of the developing countries' total food supply. They made a major contribution to Southeast Asia's "green revolution", which involved the introduction of high-yielding varieties of wheat and rice in the late '60s and early '70s.

CIDA provided close to \$12 million to CGIAR-supported centres in 1983-84. As an example of the work done at the centres, the International Centre of Tropical Agriculture (CIAT), headquartered in Colombia, works on increasing the quality of bean, rice and cassava crops in the Caribbean and Latin America, and develops techniques for using land, particularly infertile

land, in the region more productively. It received \$1.5 million from CIDA in 1983-84. As a result of the work performed by CIAT in Colombia, rice production rose from 3 metric tons per hectare in 1968 to 5.2 metric tons per hectare in 1980, and the amount of land irrigated for rice-growing has increased from 115,000 hectares in 1969 to 230,000 hectares in 1977. Today Colombia is a rice-exporting country.

Even with budgetary increases on the order of 10 per cent per year, which will likely bring the total budget of the CGIAR system close to \$200 million in 1985, there is no doubt that international centres cannot bear the total responsibility of solving all the technical problems related to increased agricultural production in the developing countries. National capacities also have to be developed, and this includes training of researchers, research managers and technicians, and upgrading research facilities. CIDA currently provides this type of assistance to over a dozen countries, including Kenya, Ghana, Bangladesh, India, Brazil, Peru and Haiti.

In India, the Indian Council for Agricultural Research (ICAR) in cooperation with the Canadian government, set up a dryland farming project in the early '70s to carry out experiments under arid and semi-arid conditions. The project goals were to transfer and adapt to local conditions some of the farming techniques and tillage equipment which had proved very beneficial in conserving water and improving yields in western Canada.

CIDA's participation, which is still on-going, has consisted of providing Canadian research personnel, defraying their travel costs and those of their Indian counterparts, and providing equipment for laboratory and field work. CIDA also funded the construction of a research and training centre at Hyderabad. Research activities conducted at experimental stations and on farmers' fields have been quite successful. Today, in most villages, the yields of crops have doubled, owing to the use of improved varieties and more efficient tillage and sowing techniques aimed at conserving water and controlling weeds. One of the difficulties with the project, as with many agricultural research projects, has been incorporating the research results into the traditional practices of the farmers. Similar projects are also underway in Sri Lanka, Pakistan, Sudan and Tanzania.

#### Grain Storage

In 1979, in cooperation with the Zambia National Agriculture Marketing Board (NAMBOARD), CIDA began work on a construction project for 64 storage sheds covered with stainless steel sheathing. These facilities, located in strategic locations throughout the country, are for storing corn and fertilizer. Because of a drop in steel prices and transportation costs, the project came in \$12 million under budget. The money saved is being used to build 20 more sheds.

#### Livestock Production

Swaziland approached CIDA in 1976 requesting assistance in increasing its milk production and reducing its reliance on imports. CIDA turned to the University of Saskatchewan's College of Agriculture.

A farm was established and some 300 Canadian Holsteins brought in to provide the base for a productive herd. A feed mill and dairy processing plant were also built. Offspring of the Canadian cattle were leased to local farmers on generous terms and extension workers offered advice on the care of the cattle and tips to increase production. To date, the cattle are producing good volumes of milk - equal to, if not better than, their counterparts back in Canada.

Sales of milk are increasing about 20 per cent a year. And though many shops do not have refrigeration and the climate is hot and humid, spoilage is not a problem. Customers see to it that the milk does not stay on the shelf very long.

Both the feed mill and the processing plant are profit-making. The Dairy Board is using the profits to assist small farmers to buy cows and upgrade their farms. Swazi students have gone abroad to study dairy technology at universities in Kenya and Ireland and to train on dairy farms in Canada. The farm is now largely run by Swazis. A similarly successful project is underway in Malawi.

#### Integrated Rural Development

In the poorest area of Nepal, west of Kathmandu, CIDA is involved in an integrated rural development project costing \$12.3 million over three years. The Karnali-Bheri region, heavily terraced and dotted with small villages, is virtually untouched by the outside world. Almost all of the people are engaged in farming and the economy is based on barter. There are few medical facilities and malnutrition is common. Population pressure is leading to a fragmentation of holdings and in the hills over 90 per cent of the households have less than 1.5 hectares of land.

The first phase of CIDA's program is concentrated on three of 10 districts in the area. It involves not one major project but rather 200-300 small ones aimed at meeting basic needs and improving the quality of life. The program covers a wide spectrum of activities from small-scale drinking water and irrigation projects to health care centres, from family planning programs to the organization of poultry and horticulture clubs, from the maintenance of village tracks and trails to adult basic education. Sectors will be integrated so that agricultural improvements, for example, will include research, the use of new seeds, fertilizer, and extension services, and will be coordinated with irrigation, conservation, forestry and transportation.

Community participation is the cornerstone of the program. Village councils provide annual plans containing the desired projects for input into the program. The process is such that the overall strategy can be adapted to include the needs of the people as they change over time.

A concerted effort at rural development is also underway in Senegal through the Canadian Catholic Organization for Development and Peace (CCODP). Working through Senegalese NGOs, CCODP is furnishing water and self-help skills in three regions. Caritas Senegal's project is south of Dakar, and involves the digging of wells and the installation of a basic distribution

system. Canada is contributing \$750,000. In the eastern region, the Office africain de développement et de coopération (OFADEC) is opening up and irrigating land to support the resettlement of city dwellers, reversing the urban drift. The value of local labor being contributed is estimated at \$1.5 million. Finally, the Centre d'animateurs ruraux d'Affiniam (CARA) is training young people in ox-drawn plowing and in the use of new varieties of rice in the Casamance region. Canada's contribution - including funding from CCODP - amounts to \$921,000.

#### Land and Water Development

In Pakistan, an extensive irrigation network - the largest in the world - that provides water to two-thirds of the country's arable land is also serving to depress crop yields. When the system was constructed some 100 years ago, little thought was given to drainage. The build up of water over the years has caused a serious waterlogging problem with seeds often rotting in the wet soil.

With the high water table, much of the salt in the soil has been rising to the surface. The water flow throughout much of the irrigation system has proven too weak to flush out the salt and large tracts of land have become barren. Some 4,000 to 8,000 hectares of crop land are being lost each year to salinization and waterlogging.

In response to this problem, CIDA has joined forces with the World Bank and the Pakistan government in a large-scale Salinity Control and Reclamation Project (SCARP). Located in Mardan, one of the least developed areas of the country, the project covers some 28,000 hectares. The land is fertile and the climate is good but production is low and the population density per cultivated hectare is almost double that of the rest of Pakistan.

CIDA's contribution of \$30 million will be used to increase production on 4,800 hectares. Drainage and irrigation systems will be enlarged and improved, and roads constructed so that farmers can bring their produce to market. Also included are extension, seed, fertilizer and plant protection programs as well as credit and marketing assistance.

An estimated 60 per cent of the project's benefits will go to farmers with less than 10 hectares and earning under U.S. \$110 per year. Usually located at the ends of the watercourses where water flow is the weakest and, in times of shortages, non-existent these farmers will gain significantly from the doubling of the irrigated water to be supplied. The extension service system will also have an impact since small farmers have little chance under the present system to learn about modern cultivation methods, such as crop rotation, except through word of mouth. Overall, the project is expected to increase small-farm incomes threefold over the next 15 years.

In 1980 CIDA contributed \$75,410 to a soil conservation project in Bolivia in cooperation with the Canadian Hunger Foundation. The prime objective of the project was to help refugees settle on land in the Santa Cruz area and manage it efficiently. A variety of methods were employed: crop rotation; establishment of cattle-breeding centres; provision of credit for the

purchase of livestock and the establishment of feedlot operations; provision of veterinary services; use of animals for clearing the land; and consolidation of agricultural cooperative structures.

Creation of Farm Credit Institutions

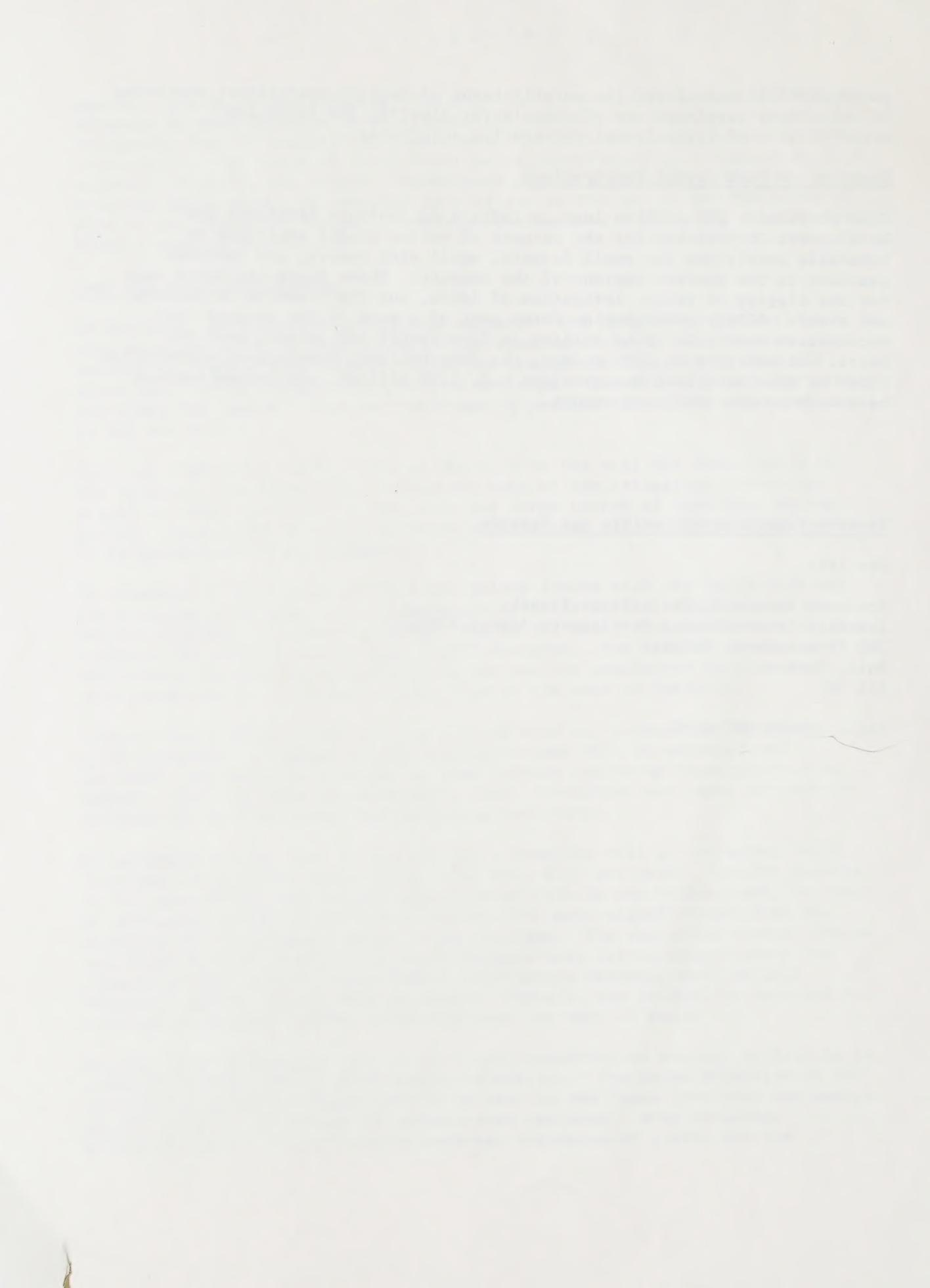
CIDA provided a \$50 million loan to India's Agriculture Refinance and Development Corporation for the purpose of making credit available on favorable conditions for small farmers, small plot owners, and landless peasants in the poorest regions of the country. These funds are being used for the digging of wells, irrigation of lands, and the breeding of poultry and sheep. CIDA's contribution forms part of a much larger program that encompasses some U.S. \$1.6 billion in farm credit and extends over two years. In addition to CIDA's loan, the International Development Association (IDA) of the World Bank has provided U.S. \$350 million, and Indian sources have made up the remaining amount.

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